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Preface

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The point of departure of this volume has been a conference, "From Practice to Results in Logic and Mathematics", organized by the PratiScienS group in June 2010 in Nancy. The present volume does not contain, properly speaking, the proceedings of this conference. Indeed, the book is the result of a separate call for papers, and there is no exact coincidence between the papers it includes and the contributions of the initial conference. Nevertheless, the conference and this volume have been initiated in the same spirit and with the same motivations. These are the spirit and motivations of the PratiScienS project so as a matter of preface, I would like to say a few words about them.

PratiScienS stands for 'Rethinking Sciences from the Standpoint of Scientific Practices'. The project started in 2007 and is pursued by a small interdisciplinary group of France-based historians, philosophers and sociologists of science (where 'science' must be understood here in a sense which includes mathematics and logic in addition to the empirical sciences). The general idea is to achieve a fine-grained characterization of the *actual* practices of scientists, and to investigate philosophically significant issues about these practices (such as the issue of robustness, that is, how something acquires the status of a robust result in the empirical and the formal sciences [1], or the issue of the contingency/ inevitability of robust scientific achievements).

The investigation of these issues requires a methodological reflection on the means and difficulties that a study of scientific practices implies, and the development of exploratory tools suitable for each scientific field. It also requires a clarification of what it means to study a scientific field *from the standpoint of practices,* including an analysis of what a practice is, of how to conceptualize a scientific practice, how to individualize (that is, identify) *this or that* scientific

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1. *Characterizing the Robustness of Science : After the Practice Turn in Philosophy of Science,* L. Soler, E. Trizio, T. Nickles et W. Wimsatt (eds.), Springer, 2012.

practice as one *unitary* practice, and so on. Quite astonishingly, these questions are rarely addressed, despite the fact that even a superficial look to the existing studies conducted under the heading of 'practices' reveals heterogeneous and possibly conflicting underlying answers to them.

The exploration of such questions involves the specification of the kinds of studies that are commonly contrasted to practice-based inquiries of science (be it with respect to their aims, their scope, their methods or the kind of accounts they produce). When we scrutinize the way this contrast appears in the literature, we meet important distinctions such as : (a) Practices as processes, dynamical actions and procedures, contrasted with the propositional products of these practices (theories, experimental facts, results of a mathematical theorem, etc.) ; (b) Ongoing, day-to-day, real-time actual science (science as it is really practiced, science in action) contrasted with science as it is *a posteriori* reconstructed by practitioners, notably in their publications ; (c) Real science opposed to idealized accounts provided by philosophers—most of the time in a derogatory sense of the term 'idealized', that is, in a sense implying the allegation to have produced a one-sided and truncated, if not a completely deceitful account of what practitioners *indeed do* and what the science under scrutiny *really is*...

Further work is needed in order to progress in these questions. This is already the case for the practice-based studies of the empirical sciences, but this is even more required when the target is the formal sciences, because after the 1980s, in the first decades of the so-called 'practice turn', the practice-based investigations of science have been primarily, if not exclusively, focused on *empirical* sciences (and first of all on *experimental fields* exemplified by experimental physics, prototypically, through laboratory studies of physics in action). Mathematics has not often been the targeted object of such kinds of inquiries, let alone logic. Actually, the mainstream philosophy of mathematics and logic has remained mostly focused on foundational issues, probably for reasons that have to do with the common idea of mathematics as the domain of necessary truths established once for all through deductive, apodictic proofs.

This being said, in the last decades, a growing interest in mathematical and logical practices has become more and more tangible. Practice-based approaches *of mathematics* have been valued as fruitful by more and more scholars, and more and more work has been done under the banner of mathematical practice. A similar, although delayed and more timid movement can be noticed in the case of logic. So it seems that we are in the process of an important methodological shift in the philosophical investigations of mathematics and logic.

This methodological shift has all chances to go with a renewal of the current philosophical conceptions of mathematics and logic : in the same manner as practice-based studies of the natural sciences have transformed the image of physics and other experimental sciences, practice-based studies of mathematics

and logic should enrich and modify our ideas about mathematics and logic. To contribute to this shift was the main motivation for the organization of the 2010 conference. The present volume, I hope, will help to get a better sense of the central issues, exploratory methods and dominant trends in the practice-oriented studies of mathematics and logic today.

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